

## AUTOMATED OVERLAY METROLOGY SYSTEM

## ABSTRACT OF THE DISCLOSURE

Non-imaging measurement is made of misalignment of lithographic exposures by illuminating periodic features of a mark formed by two lithographic exposures with broadband light and detecting an interference pattern at different wavelengths using a specular spectroscopic scatterometer including a wavelength dispersive detector. Misalignment can be discriminated by inspection of a spectral response curve and by comparison with stored spectral response curves that may be empirical data or derived by simulation. Determination of best fit to a stored spectral curve, preferably using an optimization technique can be used to quantify the detected misalignment. Such a measurement may be made on-line or in-line in a short time while avoiding tool induced shift, contact with the mark or use of a tool requiring high vacuum.

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